Contributions of Early Muslim Scientists to Engineering Studies and Related Sciences

Abdi O. Shuriye
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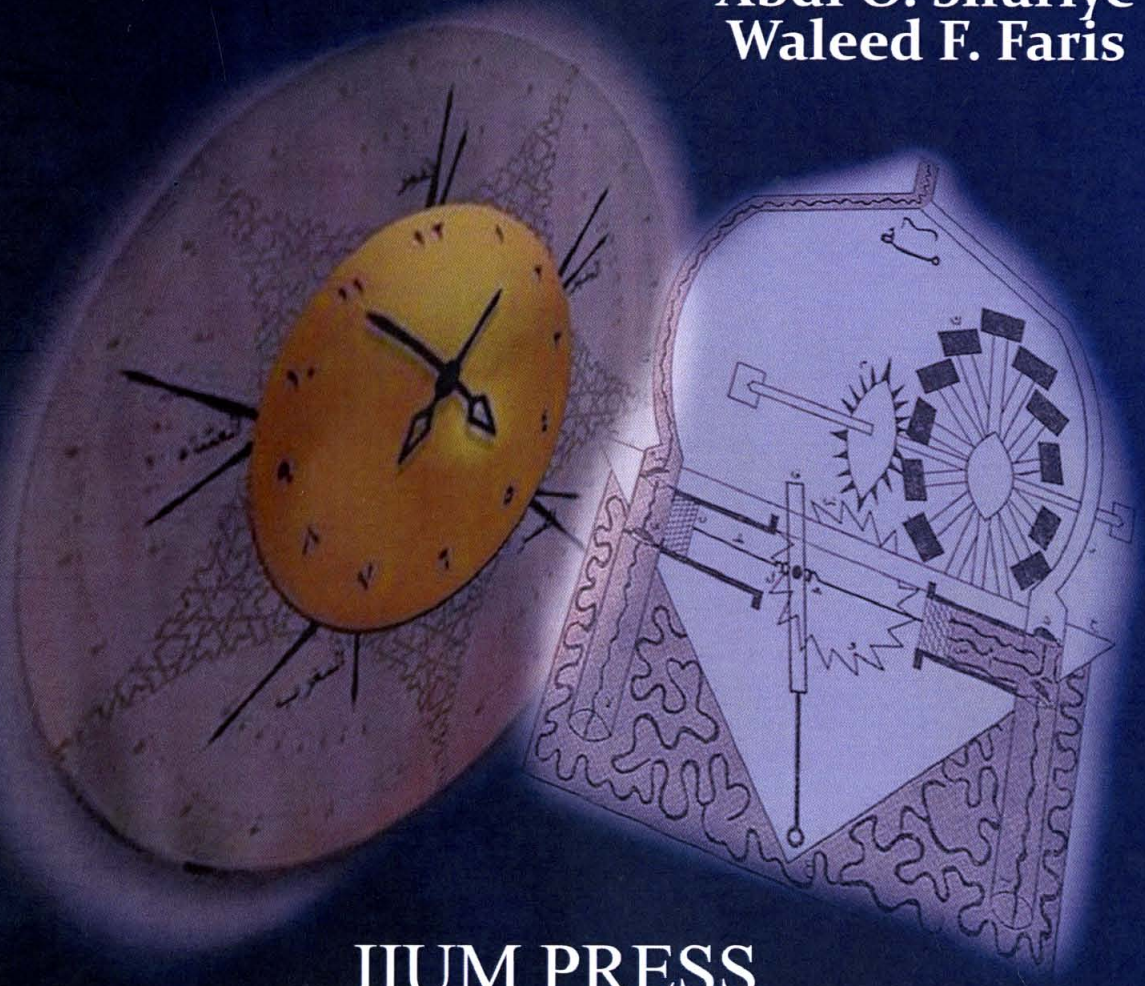

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Contents

CHAPTER NINETEEN

THE CONTRIBUTION OF IBN SAHL IN REFRACTION OF LIGHT

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19.1 INTRODUCTION

The methodology adopted in this chapter is library based research and data is collected from reliable sources. This chapter investigates Ibn Sahl work in refraction of light. The main focus of the chapter to provide answers on Ibn Sahl analysis of refraction of light and parabolic mirror, Biconvex lenses. The chapter argues that Ibn Sahl was the first Muslim who put the first law of refraction of light not Snell's. The significance of this chapter is the revelation of Ibn Sahl effort in the study of one the most essential things in our life; refraction of light.

19.2 IBN SAHL THROUGH HISTORY

Throughout human history, the light has been something most of mankind has taken for granted. It is there throughout our lives for most of us, and (so we assume) will always be there in the familiar patterns we experienced as we grew up. To gain any understanding of light itself, we need to step away from this mind-set and examine light from a more scientific and objective viewpoint. Let's start with a dictionary definition of light, with some technical data included. Light is a form of radiant energy that stimulates the organs of sight, having for normal human vision wavelengths ranging from about 3900 to 7700 angstroms and traveling at a speed of about 186,300 miles per second. By understanding of the behaviour of lights, scholars throughout history had discovered a lot of theories related to light. One of the most interesting and important is how optical devises was created by the understanding of it. A lens is an optical device with perfect or approximate axial symmetry which transmits and refracts light, converging or diverging the beam. A simple lens consists of a single optical element. A compound lens is an array of simple lenses (elements) with a common axis; the use of multiple elements allows more optical aberrations to be corrected than is possible with a single element. Lenses are typically made of glass or transparent plastic. Elements which refract electromagnetic radiation outside the visual spectrum are also called lenses: for instance, a microwave lens can be made from paraffin wax. One of the famous Muslim scholars was Ibn Sahl (c. 940-1000) who explains about the refraction of light. He was a Muslim mathematician, physicist and optics engineer of the Islamic Golden Age associated with the Abbasid court of Baghdad. In 984 Ibn Sahl's wrote a treatise On Burning Mirrors and Lenses which sets out his understanding of how curved mirrors and lenses bend and focus light. Ibn Sahl is credited with first discovering the law of refraction, usually called law. The objective of this